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adopted as the subspecific criterion, what a lot of changes we would be in for. Think of the opportunities among the Empidonacæ, and the gulls!

Oberholser (*loco citato*, p. 79) implies that because a form is clearly a "geographic race," this consideration alone is a reason for employment of the trinomial. Is it necessary for him to be reminded that according to widely held current belief the great majority, if not all, of the lesser differentiated species, among the higher vertebrate animals, are but the results of geographic variation and isolation? There may be species of hybrid origin, but if so, they are relatively rare. Geography, the evolution of habitats through time, has been the *sine qua non* of vertebrate speciation: Very many *good* species are "merely" geographic variants.

The subspecies concept will fall, just as some few people devoutly hope it will (and we will get back to pure binomials for every form recognizable at all), if it fails to be used on a consistently definite basis. Of course there is no real phylogenetic difference between a species and a subspecies. Degree of difference is a subjective matter; and the only criterion left is that of intergradation, *actually known to exist*.—J. GRINNELL, *Museum of Vertebrate Zoology, Berkeley, California*.

RECENT LITERATURE

Beebe's 'A Monograph of the Pheasants.'—In November, 1918, appeared the first volume of Mr. William Beebe's 'Monograph of the Pheasants' which was reviewed in 'The Auk' for January, 1919. Now after a lapse of two and a half years the second volume is before us and we are informed by the New York Zoological Society, under whose auspices the work is being published, that they expect to deliver the two remaining volumes during 1922. Considering the complications in printing and publishing that we have had to face, during the past few years, the progress of this work has been most commendable.

Volume II maintains the same high standard that was set by its pre-

¹ A Monograph of the Pheasants. By William Beebe, Curator of Birds of the New York Zoological Park; Fellow of the New York Zoological Society and Director of the Tropical Research Station in British Guiana; Fellow of the American Ornithologists Union and of the New York Academy of Sciences; Member of the British Ornithologists Union; Corresponding Member of the Zoological Society of London, etc. In Four Volumes. Volume II. Published under the auspices of the New York Zoological Society by H. F. and G. Witherby. 326 High Holborn, London, England, 1921. Royal Quarto. (12 × 16 in.) pp. i-xv + 1-269, 24 colored plates, 24 photogravures and 5 maps. Edition limited to 600 copies: price of each volume \$62.50.

decessor except, perhaps, in the quality of the color plates. The first volume was characterized by such a wealth of artistic talent, both artists and engravers, that a comparison is inevitable. In it Thorborn contributed six paintings, Lodge eight, and Knight one while of the present series Lodge furnishes nineteen and Knight two, and we miss the exquisite work of Thorborn entirely. It is in the matter of reproduction, however, that the greatest difference is to be seen, the plates, on egg-shell paper, apparently done in England, are, we think, equally good in each series, but in Volume I there were a number on smooth surface paper by Frisch of Berlin, which are unsurpassed for beauty and delicacy, while Volume II contains only one of these. We fully realize however the impossibility of having reproductions done in Berlin under present conditions, and criticism of the reproduction of the present plates would not be fair, as they are, when all has been said, exceedingly beautiful.

The two plates by C. R. Knight are hardly up to the standard and the one of the Bornean Fire-Back especially demonstrates that oil paintings are unsatisfactory as a basis for illustrations of this kind.

Gronvöld's pictures of young birds are admirable and the photogravures are exceedingly delicate in execution, while the landscapes are beautiful examples of photography.

The plan of this volume follows closely that of its predecessor, but we notice some additional subject headings as for instance, "Daily Round of Life," under which the life history of certain species is given in greater detail. The species considered in Volume II fall into three groups (1) the Kaleege Pheasants, (*Gennaeus*), (2) the Fire-backs and their allies (*Acomus*, *Lophura* and *Lobiophasis*) and (3) the Junglefowl (*Gallus*).

The first group is of interest on account of the great number of species that have been described. Of these Mr. Beebe recognizes only nine, regarding the other twenty-six, of which by the way no less than nineteen were described by Oates, as hybrids. These apparently all come from a narrow strip in Burma where the range of *G. lineatus* joins that of *horsfieldi* and *nycthemerus*. Many of these forms are based upon one or two individuals and in other cases no two of the specimens that have been secured are exactly alike, both of which facts tend to corroborate Mr. Beebe's views as to their status. The problem is one of great interest, however, and well worthy of the careful consideration that he gives it. Others who have studied the group may not agree as to the full specific rank of all the forms which he recognizes and may perhaps concede a place to some that he has suppressed, but the facts of the case are clearly set forth whatever the systematic value of the forms may be, and some of the hybrids are figured. These pheasants range across Asia from China to the western Himalayas in Kashmir, the silver white species on the east and the darker colored ones to the west with a distinct form in Hainan and quite aberrant ones in Formosa and in Indo-China.

The Fire-backs are found in Sumatra, Borneo and the Malay region,

Borneo having one representative of each of the three genera, with *Lobiophasis*, the remarkable White-tailed Wattled Pheasant, restricted to it. While not presenting the problem of hybridism offered by the Kaleege, the Fire-backs are interesting for other reasons. In *Acornus*, for example, the sexes are remarkably similar, while in the allied *Lophura*, they are entirely different, a very peculiar condition in two genera so closely allied.

The Junglefowl naturally attract the attention of the general reader more than any other group of Pheasants from the fact that they include the Red Jungle Fowl, the ancestor of our domestic chicken. Mr. Beebe recognizes four species of these birds (1) the Red Junglefowl (*Gallus gallus*) of India, Siam, the Malay region and Sumatra, (2) the Ceylon Junglefowl (*G. lafayetti*) from Ceylon; (3) the Javan Junglefowl (*G. varius*) from Java and the islands just east of it and (4) the Gray Junglefowl (*G. sonnerati*) from central and southern India.

While Mr. Beebe has fully described the habits and habitats of the wild pheasants he has had in the case of the Red Junglefowl an opportunity to follow out the long and interesting association of a bird with mankind of which he has taken full advantage. He finds that this bird is referred to as domesticated in China as early as 1400 B. C. and was known at an early date in Persia, but is not mentioned in the old Testament. It spread, as a domestic species, westward through Asia Minor and Europe, and eventually throughout the world except in the arctic regions. In many of the Pacific Islands and the Philippines, after having been introduced as a domestic bird, it again became wild, which gave rise to claims of the existence of distinct native species in such localities. Man's interest in rearing domestic fowls has been threefold; (1) for their flesh and eggs, (2) for cock-fighting, (3) for the production of beautiful or abnormal strains, for exhibition purposes.

Under the first heading, many forms of large stature with an abundance of meat have been evolved as well as others in which the egg laying capacity has been increased from the normal set of 4 to 8 eggs to no less than 196 a year, which is a recorded average number for 600 hens in one American poultry yard. Along with this tremendous egg laying power, however, these birds have lost all instinct to incubate and will no longer hatch their own eggs. Game chickens require comparatively no "breeding" as the wild Junglefowl was an adept fighter and this race of fowl has thus ever remained closest to the wild strain.

Among the results of artificial breeding are the long-tailed Japanese fowls, the tail feathers of which have reached the extraordinary length of twenty feet, two inches. This development is said to be due to a suppression of the molt, the feathers growing continuously, but this is difficult to understand in view of our present knowledge of feather growth and development, and a little more detailed information on the matter would have been welcome.

Another development of the "chicken fancier" is the curious Seabright race in which the cock is exactly like the hen.

The nomenclature of domestic chickens seems to be sadly confused as we learn that the so-called Cochín China fowls originated in Shanghai, and the Bramas in America.

The other species of wild Junglefowl have not figured extensively in domestication but Mr. Beebe's account of the hybridising of the Javan species is interesting and amusing. The wild cock when crossed with a domestic hen produces a bird with a remarkable penetrating and raucous voice which can be heard for a mile or more. These birds are highly prized by the natives and are matched against one another not as fighters, but as vocalists, and prove quite as satisfactory subjects upon which to wager money as do the game cocks. They are kept singly in wicker baskets hung high above the houses on tall bamboo poles where they crow continually, and keep in good voice.

Mr. Beebe's book is replete with interesting information while the pen pictures of the homes of the wild pheasants and his experiences in trailing them, are written in his familiar graphic style and we are taken successively to the higher slopes of the Himalayas, to the dense Malay jungles and to the islands of the tropical seas, wherever these beautiful birds exist. We heartily congratulate him and his publishers upon the successful progress that they are making with this notable work. It seems proper too, in this connection to recall the fact, that may not be known to all of our readers, that for the first volume of the 'Pheasants' Mr. Beebe was awarded the Daniel Giraud Elliot medal by the National Academy of Sciences.—W. S.

Mathews' and Iredale's 'A Manual of the Birds of Australia.'¹—With his monumental work 'The Birds of Australia' well on the way to completion, Mr. Mathews has begun, in conjunction with Mr. Tom Iredale, what we presume will be his last word on the subject—'A Manual of the Birds of Australia.' This work, in four volumes, small quarto, will consist of a condensed presentation of the matter contained in the larger work, with such alterations or emendations as the authors deem desirable. It will thus bear the same relation to 'The Birds of Australia' as Gould's 'Handbook' does to his large folio.

The plan of the work judged by Volume I is admirable. The higher groups are well diagnosed while under each genus and species is a synonymy of original references, with accurate dates, the working out of which has formed such an important part of Mr. Mathews' researches. Under the species there are also references to the plates and a brief statement of distribution.

¹ A Manual of the Birds of Australia by Gregory M. Mathews, F. R. S. E., M. R. A. O. U., and Tom Iredale, Members of the British Ornithologists Union and Corresponding Fellows of the American Ornithologists Union. Illustrated with Coloured and Monochrome Plates by Lilian Medland. Volume I. Orders Casuarii to Columbæ. H. F. & G. Witherby, 326 High Holborn, London. 1921. pp. 1-279. pll. 1-X, and I-XXXVI. Crown 4. Price £ 3.35. per vol.